

Claims

What is claimed is:

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1. A method of storing a structured data document,
comprising the steps of:

10 a) flattening the structured data document to provide a
plurality of tags, a data entry and a plurality of format characters in
a single line; and

b) storing the plurality of tags, the data entry and the plurality
of format characters.

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2. The method of claim 1, wherein step (b) further includes
the steps of:

b1) storing the plurality of tags in a tag and data store;

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b2) storing the plurality of format characters in a map
store.

3. The method of claim 2, further including the steps of:

b3) storing the data entry in the tag and data store;

b4) storing a first pointer in the map store that points to
the plurality of tags in the tag and data store;

b5) storing a second pointer in the map store that points
to the data entry in the tag and data store.

4. The method of claim 1, wherein step (a) further includes
the steps of:

a1) receiving the structured data document;

a2) determining a first data entry;

a3) placing in a first line a first plurality of open tags
proceeding the first data entry and the first data entry;

a4) determining a next data entry; and

a5) placing a next plurality of open tags proceeding the
next data entry in a next line.

5. The method of claim 4, further including the steps of:

a6) repeating steps (a4) and (a5) until a next data entry
is not found.

6. The method of claim 4, wherein step (a3) further includes the step of:

i) placing a format character in the first line.

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7. The method of claim 4, wherein step (a3) includes the step of:

i) placing in the first line, a number that indicates a level of a first tag that was opened.

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8. The method of claim 4, wherein step (a3) includes the step of:

i) placing in the first line, a number that indicates a number of tags that are consecutively closed after the first data entry.

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9. The method of claim 4, wherein step (a3) includes the step of:

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i) placing in a first line, a number that indicates a line number of a parent of a lowest level tag.

10. The method of claim 4, wherein step (a3) includes the step of:

5 i) placing in the first line, a number that indicates a level of a first tag that was opened but not closed.

11. The method of claim 4, wherein step (a3) includes the step of:

10 i) placing in the first line, a character that indicates a line type.

12. The method of claim 4, wherein step (a3) includes the step of:

15 i) placing in the first line, a character that provides line control information.

20 13. The method of claim 4, wherein step (a1) further includes the step of:

i) receiving an extensible markup language document.

14. The method of claim 4, wherein step (a4) further includes the steps of:

5 i) determining a format character.

15. The method of claim 4, further including the step of:

a6) placing the next data entry in the next line.

10 16. A method of flattening a structured data document, comprising the steps of:

15 a) receiving the structured data document;
b) determining a first data entry; and
c) storing in a first line a first plurality of open tags and storing the first data entry.

20 17. The method of claim 16, further including the steps of:

d) determining a level of a first opened tag;
e) storing the level of the first opened tag in the first line.

18. The method of claim 16, further including the steps of:

d) determining a number of consecutive tags closed after the first data entry;

5 e) storing the number in the first line.

19. The method of claim 16, further including the steps of:

d) storing a line number.

10 20. The method of claim 16, further including the steps of:

d) determining a next data entry;

e) storing a next plurality of open tags proceeding the next data entry in a next line;

15 f) repeating steps (d) and (e) until a next data entry is not found.

21. The method of claim 16, wherein step (b) further includes the step of:

20 b1) determining that the first data entry is a null.

22. The method of claim 20, wherein step (e) further includes the steps of:

5 e1) storing a plurality of format characters associated with the next data entry.

23. The method of claim 20, further including the steps of:

10 g) expanding a flattened data document into the structure data document using a plurality of formatting characters.

24. A method of storing a structured data document, comprising the steps of:

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- a) flattening the structured data document to contain in a single line a tag, a data entry and a formatting character;
 - b) storing the formatting character in a map store; and
 - c) storing the tag and the data entry in a tag and data store.
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25. The method of claim 24, further including the step of:

d) storing a first pointer in the map store that points to the tag in the tag and data store;

5 e) storing a second pointer in the map store that points to the data entry in the tag and data store.

26. The method of claim 24, further including the step of:

10 d) creating a cell in the map store for each of a plurality of lines in a flattened document.

27. The method of claim 26, further including the steps of:

15 f) receiving a request to delete one of a plurality of data entries;

g) determining the cell associated with the one of the plurality of data entries;

h) setting a delete flag.

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28. The method of claim 27, further including the steps of:

i) receiving a restore command;

j) unsetting the delete flag.

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29. The method of claim 26, further including the steps of:

f) receiving a request to delete one of a plurality of data entries
and a plurality of related tags;

5 g) setting a delete flag equal to the number of the plurality of
related tags plus one.

30. The method of claim 24, further including the steps of:

10 d) receiving a request to insert a new entry;

e) finding a previous cell containing a proceeding data entry;

f) storing the new entry at an end of the map store;

g) moving a contents of a next cell after the new entry;

15 h) storing an insert flag and a pointer to the new entry in the
next cell.

30. The method of claim 30, further including the step of:

20 i) storing a second insert flag and a second pointer after the
contents of the next cell.